

MPG 8730.3

REVISION D

EFFECTIVE DATE: March 28, 2003

EXPIRATION DATE: March 28, 2008

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# **MARSHALL PROCEDURES AND GUIDELINES**

**QS01**

## **CONTROL OF NONCONFORMING PRODUCT**

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### DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		5/14/99	Document converted from MSFC-P13.1 to a Directive. Previous history retained in system as part of canceled or superseded ISO Document files.
Revision	A	8/20/99	Made changes due to reorganization and updates to applicable document references. Clarified purpose to include installation and assure safe products. Deleted Class I change criteria and added definitions for critical, major, and minor characteristics. Replaced Chief Engineer with Systems Engineer as required. Paragraphs 1.2.1, 1.2.2, and 1.2.3: replaced "MRB/Project" with "analysis" as previously stated in baseline version.
Revision	B	4/24/00	<p>Page 6, paragraph P.4 j: The reference to MWI 5300.1 was changed to MWI 5100.1.</p> <p>Page 6, paragraph P.4 f: Added MPG 8730.1, "Inspection and Testing."</p> <p>Page 6, paragraph P.4: Made changes to reflect cancellation of MPG 1441.1, "Control of Quality Records", and replacement with MPG 1440.2H, "MSFC Records Management Program". Also, added reference to MSFC-Tag 10 and included figure 6.</p> <p>On page 8, paragraph 1.1ee; added, "QA" to the Acronyms and abbreviations.</p> <p>On page 8, paragraph 1.1a; page 18, paragraph 3.2(n); and page 27, figure 2: Deleted references to ABCSS.</p> <p>Page 8, paragraph 1.1k: Deleted DRS from the acronym list and added ICMS.</p> <p>Page 11, paragraph 1.5: Changed "propulsion test area" to "Space Transportation Directorate, Technology Evaluation Department."</p> <p>Page 12, paragraph 2.1.2: Added the following sentence to the end of the paragraph, "For the Space Transportation Directorate, Technology Evaluation Department activities (East and West Test Areas) Withhold Tags may also be applied to ground support equipment, test facility components, and propellant and pressurant system components."</p> <p>Page 14, paragraph 3.1(a): Added the following to the end of the paragraph, "Initiate a Squawk Tag to document release of product prior to completion of required inspections or tests per MPG 8730.1."</p> <p>Page 14, paragraph 3.1(c): Added to the end of this paragraph, "...or to recall product released prior completion of all required inspections or tests once it has been determined that requirements cannot be met per MPG 8730.1."</p> <p>Page 18, paragraph 3.2(m): At the end of the first paragraph added, "For the Space Transportation Directorate, Technology Evaluation Department activities (East and West Test Areas) a Withhold Tag will be applied to</p>

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			<p>test facility components, ground support equipment, and propellant and pressurant system components that cannot be readily removed and dispositioned."</p> <p>Deleted references to QS10-QA-012, which has been deleted as an Organizational Issuance and incorporated paragraphs into this section describing use of Withhold Tags.</p> <p>Page 19, paragraph 3.3(a): Changed "propulsion east and west test areas" to "Space Transportation Directorate."</p> <p>Page 25, paragraph 4: Made changes to this paragraph by adding the words, "...and TDR Logs", wherever "TDR" was mentioned.</p> <p>Page 33, step 26: Changed entry to read, "Enter QC acceptance stamp on the record copy and also stamp each subsequent copy individually."</p>
Revision	C	6/4/01	<p>Page 4: Added "Appendix F" (previously overlooked) and "Appendix G." Page 5, Paragraph P.1: Changed "P.2.1" to "P.2." Page 6, Paragraph P.2.d. and Paragraph P.4.e: changed "MPG 1700.1" to "MWI 8621.1." Page 6, Paragraph P.4.1: Deleted applicable document and replaced with Appendix G. Page 6, Former paragraph c. and Page 13, Paragraph 2.1.9: Removed reference to recently canceled document, MPG 1280.5. Page 6, Paragraph 1. and Page 19, Paragraph 3.2.14: Changed S&amp;MA OI reference to "Applicable S&amp;MA organizational issuances." Page 7, Paragraph P.6: Updated to cancel "MPG 8730.B" (canceled by Rev. B) and to cancel "MWI 8730.4B" (replaced by Appendix G). Page 10, Paragraph 1.1.53 and Page 30, Block 8: Added "WAD" to acronym list. Page 10, Paragraph 1.3: Changed "Reference section 6, Responsibilities" to "Reference section 2, Responsibilities." Page 13, Paragraph 2.2.1.5: Replaced "cognizant systems engineer" with "MRB Chairperson." Page 14-29: Corrected numbering to comply with MPG 1410.2. Page 17, Paragraph 3.2.j.1: Replaced "MWI 8730.4B" with "Appendix G." Page 17, Paragraph 3.2.j.3: Added Level II verbiage for clarification. Page 17, Paragraph 3.2.1: Corrected previous mistake by replacing "MWI 8730.4" with "MWI 8730.3." Page 20, Paragraph 3.3.1: Changed "section 3-2" to "section 3.2." Page 25, Paragraph 4: Added "Scrap Custody Records." Page 38, Block 33, 1: Changed "Rpr" to "RPR." Page 40, Appendix C: Changed "10-12" to "10&amp;12." Page 45, Appendix E and Page 53, Appendix G: Corrected numbering to comply with MPG 1410.2. Page 53 and 54, Added "Appendix G: Scrap Instructions." Page 53, 1<sup>st</sup> sentence: Deleted extra "be."</p>
Revision	D	03/28/03	<p>Changed document footer to address the new link to the Master List Page 6, Paragraph P.1, Changed "recording" to "documenting." Added the sentence "This process also applies to items delivered to the customer that are determined to be nonconforming after delivery or delivered</p>

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			<p>items returned by the customer due to a failure."</p> <p>Replaced references to "Systems Engineer" to "Lead Systems Engineer" throughout the document. Paragraph P.2, changed "recording" to "documenting" Page 8, Paragraph P.4, Changed, "S&amp;MA Applicable Organizational Issuances" to "QS-QA-001, Acceptance Reporting Instruction and QS-QA-003, Quality Assurance Guidelines for Test Activities Paragraph P.6, Replaced "MPG 8730.3B" with "MPG 8730.3C." Removed reference to recently canceled document, MWI 8730.4B. Deleted "Original Signed by Sidney P. Saucier for" Page 12, Paragraph 1.5, Replaced all references " throughout the document from "Space Transportation Directorate, Technology Evaluation Department" to "Space Transportation Directorate, Test and Evaluation Department." Paragraph 1.7, Replaced "specs" with "specifications" throughout the document. Changed "Non-standard" to "Nonstandard."</p> <p>Deleted "SRP." Paragraph 2.1.2, made changes in last sentence "... support equipment or test facility components." Page 13, Paragraph 2.1, Deleted ":" Paragraph 2.1.3, Changed "DRs/TDRs" to "DR's/TDR's" throughout the document. Page 14, Paragraph 2.1.8, deleted "copies of", "TDRs", and "quality records" and added to the end "the QRC." Paragraphs 2.2.1, 2.2.2 and 2.3, Deleted ":" Paragraph 2.2.1.3, Changed "ECRs" to "ECR's" throughout the document. Paragraph 2.3.3, Moved "Paragraph 2.2.1.5" to "2.3.3." Page 15, Paragraph 2.3.2, Clarified, "Approve or disapprove all MRB dispositions." Paragraph 2.4, Changed "ECRs and DARs" to "ECR's and DAR's." Page 16, Paragraph 3.2.1, Deleted "/Test Discrepancy Record" and "/TDR" to clarify. Paragraph 3.2.3, deleted references to the discrepancy record being a four-part form. Clarified sentence. Page 17, Paragraph 3.2.7, replaced first sentence with "Forward a legible DR copy to the QRC upon generation." Changed second sentence to read "QRC enter DR ..." In second paragraph, replaced "...a multipurpose DR form..." with "inputs.", deleted the second sentence, and replaced "attached to" in the third sentence with "place with non-conforming part." Paragraph 3.2.9, Changed "their" to "new" and changed second "their" to "the." Page 18, Paragraph 3.2.10.2 deleted "... that are in accordance with 3.2(1)." and added "in accordance with MWI 8730.3." Paragraph 3.2.12, Changed "S&amp;MA Records Center" to "QRC." Page 19, Paragraph 3.2.13, replaced the last sentence with "All copies may then be discarded." Page 20, Paragraph 3.2.14, Changed "S&amp;MA organizational issuance" to "QS-QA-001." Paragraph 3.2.16, Clarified sentence. Page 22, Paragraph 3.3.1, Changed "the applicable OI " to "QS-QA-003." Page 24, Paragraph 3.3.7.3, deleted "... before giving approval to proceed." Paragraph 3.3.7.5, added "... based on review of recorded results or witness of completed</p>
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			<p>activities for mandatory monitoring." To the end of the paragraph. Paragraph 3.3.7.6, Changed "TDRs" to "TDR's" throughout the document. Paragraph 3.3.7.7, Changed "TCPs, SOPs, TPSS" to "TCP's, SOP's, TPS's" throughout the document. Deleted "under a diagonal slashed line." Page 26, Paragraph 3.3.12, deleted "... in the S&amp;MA QRC" in the first sentence and added "... in the project designated record center." To the end. Deleted the second sentence. Page 27, Paragraph 4, Specified records plan for "project designated record centers." Page 28, Paragraph 5, Changed "1-4" to "1 through 4." Appendix A, Block 1, Changed "Pre-printed" to "Preprinted." Block 13, deleted "... and routes ... to the QRC." Added this sentence to the end, "The completed white copy may be retained by the closeout inspector as a historical record." Appendix B, Block 7, Changed "pre-stamped" to "prestamped." Block 29.c, deleted reference to MWI 8730.4 and changed "... disposition engineer's division chief..." to "... Lead System Engineer's signature..." Page 39, Deleted "(see CM-INST-002)." Appendix C, Added "(Form 460-1)" to title. Appendix E, Block 1.1.1, replaced "WAI" with "change".</p>
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## PREFACE

### P.1 PURPOSE

This document establishes the Marshall Space Flight Center (MSFC) policy, responsibilities, and procedures for control of nonconforming products at MSFC for activities that fall within the scope as defined by MPD 1280.1, "Marshall Management Manual" (MMM) and as defined by P.2. The purpose is to provide a system for documenting and dispositioning nonconforming products and to prevent unintended use or installation at MSFC to ensure safe products. This process also applies to items delivered to the customer that are determined to be nonconforming after delivery or delivered items returned by the customer due to a failure.

### P.2 APPLICABILITY

a. This Marshall Procedures and Guidelines (MPG) is limited to documenting and resolving nonconformances for the following:

(1) Items, which are released into the MSFC Integrated Configuration Management System (ICMS).

(2) Other hardware/software, which has not been released into the MSFC ICMS, but designated by project management, the Lead Systems Engineer, or the Director, Engineering Directorate (ED).

**NOTE:** The Program/Project Manager may be the Lead Systems Engineer.

(3) Purchased items found to be nonconforming at MSFC receiving inspection and are accepted by the contracting officer (CO).

(4) Discrepancy Records (DR) will not be used to document test facility hardware failures but they may be addressed on Test Discrepancy Records (TDR) when their failure adversely affects testing and/or hardware damage resulting from test facility failure (reference paragraph 3.3).

b. During receiving inspection at MSFC, nonconforming products detected will be documented using the Procurement Discrepancy Tracking System database referenced in MWI 5100.1, "Procurement Initiators Guide." Safety and Mission Assurance (S&MA) will verify that purchased articles and materials meet minimum and specified quality requirements.

c. When a product is accepted "as is" by the CO, a DR (MSFC Form 460) will be generated by S&MA in accordance with this procedure. Corrective action will be conducted in accordance with MPG

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1280.4, "MSFC Corrective Action System."

d. Property damage greater than \$1000 is reported and investigated per MWI 8621.1.

### **P.3 AUTHORITY**

MPD 1280.1, "Marshall Management Manual" (MMM)

### **P.4 APPLICABLE DOCUMENTS**

- a. MPD 1280.1, "Marshall Management Manual" (MMM)
- b. MPG 1280.4, "MSFC Corrective Action System"
- c. MPG 1440.2, "MSFC Records Management Program"
- d. MWI 8621.1, "Close Call and Mishap Reporting and Investigation Program"
- e. MPG 8730.1, "Inspection and Testing"
- f. MSFC Form 460, "Discrepancy Record"
- g. MSFC Tag 6, "Squawk Tag"
- h. MSFC-STD-555, "MSFC Engineering Documentation Standard"
- i. MWI 5100.1, "Procurement Initiators Guide"
- j. MWI 8730.3, "MSFC Material Review System"
- k. MWI 8040.3, "Deviation and Waiver Process, MSFC Programs/Projects"
- l. QS-QA-001, "Acceptance Reporting Instruction"
- m. QS-QA-003, "Quality Assurance Guidelines for Test Activities"
- n. MSFC Tag 10, "Withhold Tag"

### **P.5 REFERENCES**

None



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## P.6 CANCELLATION

MPG 8730.3C dated June 4, 2001

Original signed by  
Axel Roth for

A. G. Stephenson  
Director

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## DOCUMENT CONTENT

### 1. DEFINITIONS

1.1 Acronyms and abbreviations used in this document are:

1.1.1	ACC	Acceptance Test
1.1.2	C/SC	Configuration/Specification Change
1.1.3	CAS	Corrective Action System
1.1.4	CAL	Calibration
1.1.5	CCB	Configuration Control Board
1.1.6	CO	Contracting Officer
1.1.7	DAR	Deviation/Waiver Approval Request
1.1.8	DEV	Development Test
1.1.9	DR	Discrepancy Record (MSFC Form 460)
1.1.10	ECR	Engineering Change Request
1.1.11	ED	Engineering Directorate
1.1.12	ESD	Electrostatic Discharge
1.1.13	FEO	Floor Engineering Order
1.1.14	GSE	Ground Support Equipment
1.1.15	GT	Ground Test
1.1.16	I&AR	Inspection and Acceptance Request
1.1.17	ICMS	Integrated Configuration Management System
1.1.18	IFA	In-flight Anomaly
1.1.19	IR	Inspection Report (Parts Tag, MSFC Form 312)
1.1.20	MFG	Manufacturing and Assembly
1.1.21	MMM	Marshall Management Manual

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1.1.22	MPD	Marshall Policy Directive
1.1.23	MPG	Marshall Procedures and Guidelines
1.1.24	MWI	Marshall Work Instruction
1.1.25	MRB	Material Review Board
1.1.26	MRC	Material Review Crib
1.1.27	MSFC	Marshall Space Flight Center
1.1.28	PFA	Post-flight Anomaly
1.1.29	PMG	Property Management Group
1.1.30	P/N	Part Number
1.1.31	QA	Quality Assurance
1.1.32	QAL	Qualification Test
1.1.33	QRC	Quality Record Center
1.1.34	QTPS	Quality Test Preparation Sheet
1.1.35	RPR	Repair
1.1.36	RTV	Return to Vendor
1.1.37	Rwk	Rework
1.1.38	Scp	Scrap
1.1.39	S&MA	Safety and Mission Assurance
1.1.40	S/N	Serial Number
1.1.41	SOP	Standard Operating Procedure
1.1.42	Spec	Specification
1.1.43	SRP	Standard Repair Procedure
1.1.44	Std	Standard
1.1.45	STE	Special Test Equipment

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1.1.46	T/A	Test Article
1.1.47	TCP	Test and Checkout Procedure
1.1.48	TDR	Test Discrepancy Record
1.1.49	TPD	Test Procedure Deviation
1.1.50	TPS	Test Preparation Sheet (MSFC Form 248)
1.1.51	T/S	Troubleshooting
1.1.52	UAI	Use-As-Is
1.1.53	WAD	Work Authorizing Document
1.1.54	WAI	Waiver

## 1.2 Classification of Nonconforming Characteristics.

1.2.1 Critical Characteristic. A critical characteristic is one that the analysis indicates is likely, if defective, to create or increase a hazard to human safety, or to result in failure of a system or major product to perform a required mission.

1.2.2 Major Characteristic. A major characteristic is one that the analysis indicates is not critical but is likely, if defective, to result in failure of an end item to perform a required mission.

1.2.3 Minor Characteristic. A minor characteristic is one that the analysis indicates is significant to product quality but is not likely, if defective, to impair the mission performance of the part or item.

1.3 Cognizant Performing Personnel. Engineering Directorate or project personnel responsible for operations (manufacturing, test, etc.) and subject to Safety and Mission Assurance (S&MA) inspection or test monitoring activities. Where necessary, cognizant performing personnel will be defined by a project plan or task agreement (Reference section 2, Responsibilities). The term "cognizant performing personnel" refers only to personnel who have designated authority and control over the hardware/software, and does not necessarily apply to all personnel who are involved with testing.

1.4 Explainable Condition. A nonconformance reported by the initiation of a Discrepancy Record/Test Discrepancy Record

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(DR/TDR) which, after investigation, proves to be a normal condition not requiring remedial action.

1.5 Quality Test Preparation Sheet (QTPS). A TPS which is used as a nonconformance reporting/troubleshooting document in the Space Transportation Directorate, Test and Evaluation Department.

1.6 Remedial Action. Action to correct a nonconforming article or material.

1.7 Repair. A procedure, which makes a nonconforming item acceptable for use. The purpose of the repair is to reduce the effect of the nonconformance. Repair is distinguished from rework in that the characteristics after repair still do not completely conform to the applicable drawings, specifications, or contract requirements. Nonstandard Repair Procedures are authorized by Material Review Board (MRB) (MWI 8730.3) action for use on a one-time basis only.

1.8 Rework. A procedure applied to a nonconforming item that will completely eliminate the nonconformance and result in a characteristic that conforms completely to the drawings, specifications, or contract requirements. Includes both "incomplete operations" and "return to print" dispositions.

1.9 Standard Operating Procedure (SOP). Describes the more routine or basic operations and guidelines, which do not require the execution of detailed sequence of events at a specific test site.

1.10 Test and Checkout Procedure (TCP). Defines the detailed sequence of events to perform a specific test or operation on the T/A.

1.11 Test Article (T/A). Flight end items (stages, spacecraft, modules, experiments, etc.) or test end items/systems undergoing certification/qualification/acceptance/designated development testing at the subsystems/systems level.

1.12 Test Conductor. Designated test individual with responsibility for defining, implementing, and controlling the test program. This includes activation and operation of test article system or test facility supporting systems such as instrumentation, controls, or fluid/mechanical systems.

1.13 Test Engineer. Designated test individual with responsibility for ensuring that the test program is accomplished safely and conforms to test requirements.

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1.14 Test Preparation Sheet (TPS). A work authorizing document which may define test facility buildup, test activation/operations, or hardware modification, movement, assembly, or test not previously authorized by other work authorizing documents.

1.15 Unexplained Condition. Category of TDR closure. The specified problem/anomaly occurs only once or of such low frequency that all engineering efforts (troubleshooting [T/S], analysis, review of data, etc.) have been exhausted without determination of a causal factor. Management accepts the risk of closure without a finite resolution.

## 2. RESPONSIBILITIES

2.1 Safety and Mission Assurance Office will:

2.1.1 Ensure overall implementation of this system.

2.1.2 Initiate Squawks (MSFC Tag 6), Withhold Tags (MSFC Tag 10), and DR's/TDR's (MSFC Form 460) for quality-sensitive flight and flight-associated hardware and when required by the quality plan, project plan, or task agreement. For non-quality sensitive items, project plans or agreements will specify responsibility for initiation of applicable forms. For Space Transportation Directorate, Test and Evaluation Department activities (East and West Test Areas), Withhold Tags may also be applied to ground support equipment or test facility components.

2.1.3 Evaluate Squawks and DR's/TDR's.

2.1.4 Act as MRB chairman.

2.1.5 Provide real-time tracking and statusing for DR's.

2.1.6 Provide reports as necessary to appropriate Lead Systems Engineers/responsible design organizations/S&MA Director for each project denoting the open/delinquent status of unresolved DR's.

2.1.7 Provide flight readiness status and recommendations on open DR's.

2.1.8 Ensure that all DR's are forwarded to the QRC.

2.1.9 Ensure that trending and preventive action related information are provided in accordance with MPD 1280.1 and MPD 1280.4.

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## 2.2 Cognizant Performing Personnel.

### 2.2.1 Systems Engineering Office will:

2.2.1.1 Determine when it is necessary/appropriate to continue processing a nonconforming item while awaiting MRB review or WAI/deviation approval by CCB.

2.2.1.2 Provide flight readiness assessment dispositions on open DR's as required.

2.2.1.3 Initiate ECR's as required.

2.2.1.4 Evaluate/Disposition DR's/TDR's as required.

### 2.2.2 Design and Test Organization will:

2.2.2.1 Act as an MRB member as required.

2.2.2.2 Initiate TDR's as required.

2.2.2.3 Initiate ECR's, deviations, and waivers as required.

2.2.2.4 Evaluate/Disposition DR's/TDR's as required.

## 2.3 Material Review Board will:

2.3.1 Evaluate/Disposition DR's as required.

2.3.2 Disposition (approve/disapprove) all DR's submitted for material review.

2.3.3 When the MRB cannot reach unanimous approval for a DR, the MRB Chairperson will provide the final resolution.

2.4 Configuration Control Board will process ECR's and DAR's in accordance with MWI 8040.3 and provide copies through distribution, which shall enable S&MA to close the applicable DR's.

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### 3. PROCEDURE

<u>Actionee</u>		<u>Action</u>
	3.1	Squawk Tag (MSFC Tag 6)
Cognizant S&MA	3.1.1	Use the Squawk Tag (MSFC Tag 6) to document obvious/simple rework, which can be corrected without engineering disposition or detailed methodization (see Figure 1). Initiate a Squawk Tag to document release of product prior to completion of required inspections or tests per MPG 8730.1.
Cognizant Performing Personnel	3.1.2	Disposition Squawk Tag. No work will be accomplished until the disposition has been entered. The work performed on a Squawk Tag will be traceable to the individual performing the task.
Cognizant S&MA	3.1.3	Upgrade Squawk Tag to a DR if the Squawk Tag involves more than obvious/simple rework and requires detailed methodization, or to recall product released prior to completion of all required inspections or tests once it has been determined that requirements cannot be met per MPG 8730.1.  May void a Squawk Tag prior to disposition by writing "VOID" across the Squawk Tag and stamping the Squawk Tag with the inspector's stamp if written in error, for example.
Cognizant S&MA	3.1.4	Completes the Squawk Tag, a two-part form consisting of a tear-out original and a hard-card tag to be attached to or remain with the nonconforming item until closure. Make all entries on Squawk Tags either typewritten or with black ink (only) ballpoint pen to facilitate legible copies.
Cognizant S&MA	3.1.5	Initiates and closes the Squawk Tag in accordance with Appendix A.
	3.2	Discrepancy Record (MSFC Form 460)
Cognizant S&MA and	3.2.1	Use Discrepancy Record (DR) (MSFC Form 460) to define all other nonconformances to



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Cognizant Performing Personnel applicable drawings, specifications, tests, or other requirements. The DR is utilized for recording and dispositioning hardware/software nonconformances (see Figure 2) for projects under the cognizance of the S&MA Office including in-flight and post-flight anomalies.

Cognizant Performing Personnel 3.2.2 Present the deviation, when an item is known "before-the-fact" to have a Configuration Control Board (CCB) approved deviation, to S&MA along with the item and its associated documentation to preclude initiation of a DR for a nonconformance which has been previously dispositioned.

Cognizant S&MA 3.2.3 Use MSFC Form 460, "Discrepancy Record," to initiate and close DR's per Appendix B.

Initiate a separate DR for each nonconformance, except that multiple nonconformances involving a single item of hardware at a single inspection point may be listed on one DR.

Cognizant S&MA 3.2.4 S&MA will issue a control number for all DR's and will stamp or sign each DR ensuring that the DR is written correctly and is valid.

Cognizant S&MA 3.2.5 Will not void completed DR's or worked portions thereof.

The S&MA supervisor or lead may void the DR if a DR has been dispositioned but the work has not been performed. The S&MA supervisor or lead will enter "VOID" and state the reason in the disposition section above the Final Acceptance block 34 of the DR. S&MA will sign the statement and obtain the engineering signature from the same or higher supervision level than original disposition approval.

DR's, which have not been dispositioned, may be voided by the S&MA supervisor or lead with this same process but do not require engineering signatures.

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When a disposition voids, deletes, or changes any unworked portion of a DR, a notation will be made next to the voided, deleted, or changed paragraphs, and S&MA will stamp adjacent to the notation.

Cognizant  
Performing  
Personnel  
and S&MA

3.2.6

All entries made on DR's will be either typewritten or made with black ink (only) ballpoint pen to facilitate legible copies. MSFC Form 460, DR, will be completed in accordance with Appendix B.

Cognizant  
S&MA

3.2.7

Forward a legible DR copy to the QRC upon generation. QRC enter DR into Corrective Action System (CAS) database within 1 working day of initiation to facilitate screening for corrective action per MPG 1280.4.

Use MSFC Form 460 inputs to define recurrence prevention problems and dispositions in accordance with MPG 1280.4. Place DR in Electrostatic Discharge (ESD) protective holder and place with non-conforming part. Request initial review and disposition from cognizant technical and performing organization's representatives.

Cognizant  
Performing  
Personnel

3.2.8

Enter the following on the DR disposition if remedial action cannot be completed:

"Transfer this DR to (organization) per notification by (organization and person's name) on (date)."

Cognizant  
Performing  
Personnel

3.2.9

Forward the hardware and the DR to the new organization to which the responsibility has been transferred.

Provide remedial action for new area of responsibility for hardware transferred to the laboratory.

Cognizant  
Performing  
Personnel

3.2.10

The following DR dispositions may be made, proposed, or requested via an initial review by the performing and design organizations:

1. Scrap, Return to Vendor (RTV), or rework.  
(Note: An RTV or scrap disposition will

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require coordination with the project office having funding responsibility for the discrepant part). Control and disposal of hardware dispositioned as scrap will be in accordance with Appendix G.

2. Request MRB disposition for "use as is" and repair dispositions of nonconformances of minor characteristics in accordance with MWI 8730.3.

3. If it is determined that a major or critical characteristic is affected, a DAR will be prepared in accordance with MWI 8040.3. The DR will not be closed until S&MA receives an approved DAR with the approving CCB Directive. If a Level II requirement is affected, the DR can only be closed by documentation from the Level II authority.

Cognizant Performing Personnel	3.2.11	If an engineering problem is indicated, an ECR will be prepared and submitted to the applicable CCB for disposition. Advance implementation of work proposed via an Engineering Change Request (ECR) may be implemented prior to the CCB disposition by utilizing a Floor Engineering Order (FEO) in accordance with MSFC-STD-555.
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Material Review Board	3.2.12	For DR's <u>not</u> classified as critical or major, a MRB will disposition the nonconformance in accordance with MWI 8730.3.
-----------------------	--------	-------------------------------------------------------------------------------------------------------------------------------

The DR will serve as the record of the MRB disposition and, upon closure, will be forwarded to the QRC by the S&MA personnel making final acceptance of the DR.

All repair procedures will be approved by the MRB. SRP's will consist only of those authorized by the ED Director as official institutional SRP's applicable to all projects or those authorized by MRB as official project unique SRP's applicable to that project. All SRP's will contain specific definitive application criteria.

Cognizant	3.2.13	A Withhold Tag, MSFC Tag 10 (see Figure 6),
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S&MA

will be attached to nonconforming items scheduled for review by the MRB when the item will not be moved to a Material Review Crib (MRC) and the DR is separated from the item. When an item is placed in a MRC with the DR, a Withhold Tag is not required. For the Space Transportation Directorate, Test and Evaluation Department activities, a Withhold Tag will be applied to test facility components, ground support equipment, and propellant and pressurant system components if they cannot be readily removed and dispositioned.

The red or hard copy shall be attached to the nonconforming item, and the paper copies attached to the discrepancy report, QTPS, or other nonconforming documentation.

Hardware with a Withhold Tag attached shall not be opened, moved, modified, or otherwise disturbed until the nonconformance has been dispositioned and either the work authorizing documentation is released to implement the disposition, or work authorizing documentation is released to troubleshoot or investigate prior to final disposition. S&MA Quality Assurance (QA) personnel shall remove the Withhold Tag upon implementation of the disposition. All copies of the record may then be discarded.

Cognizant 3.2.14  
S&MA

Dispositions of use-as-is (UAI), repair-to-standard repair, repair-to-non-SRP, or authorized per previously approved Deviation/Waiver Approval Request (DAR) will be identified in the manufacturing build paper, in the as-built listings, and on the parts tag, MSFC Form 312.

All information concerning an item of hardware will be entered on the parts tag per QS-QA-001.

For parts downgraded from flight status, the parts tag shall be annotated and forwarded to the QRC.

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Lead Systems Engineer	3.2.15	<p>A nonconforming item on which a DR is awaiting MRB review or DAR processed in accordance with MWI 8040.3 disposition by the CCB may, at the discretion of the Lead Systems Engineer, continue through hardware processing operations pending formal disposition, under the following conditions:</p> <ol style="list-style-type: none"> <li>1. A written order to proceed is provided by the Lead Systems Engineer.</li> <li>2. There is no safety risk resulting from continued processing of the nonconforming part.</li> <li>3. The order to proceed includes reference to a recovery plan if the proposed disposition is disapproved. This may include limits on processing steps prior to formal disposition.</li> </ol>
Lead Systems Engineer	3.2.16	Resolves "disputed" remedial actions.
Cognizant Performing Personnel	3.2.17	Dispositions for block 29 entries will be in accordance with Appendix B. All dispositions will be identified to the person(s) making the dispositions by name or initials and date.
Cognizant S&MA	3.2.18	Block 33, Final Disposition, will be in accordance with Appendix B.
Cognizant S&MA	3.2.19	All DR's will be dispositioned and closed within 1 year of initiation unless the responsible project approves extension in writing. The closed record copy of each DR is forwarded to the Quality Records Center for filing and retention.
Cognizant S&MA and Performing Personnel	3.2.20	MSFC Form 460-1, Continuation Form, will be initiated when required in accordance with Appendix C.
	3.3	Test Discrepancy Record
Cognizant Performing	3.3.1	Following the instructions in Appendices D & E, a Test Discrepancy Record (MSFC Form 460)

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Personnel  
and S&MA

is utilized for recording and dispositioning significant test anomalies involving flight hardware/software testing or to document test anomalies/failures of Customer-Supplied Product which is at MSFC for test only and return to vendor.

Note: Within the Space Transportation Directorate, Test and Evaluation Department, the QTPS may be utilized for recording and dispositioning facility nonconformances and the initial documentation of test anomalies. If the test anomalies are related to a NASA test article, then the TDR and DR system will be utilized. Use of QTPS's will be governed by QS-QA-003 rather than this MPG.

TDR's may also be initiated to investigate in-flight or post-flight failures of MSFC hardware/software.

When troubleshooting activities on a TDR determines that a test failure is a flight hardware or software nonconformance, the TDR will be upgraded to a DR. The DR will be completed per section 3.2 and Appendix B. The TDR will remain open until the DR disposition has been completed and the test successfully re-run or a "no retest" rationale is documented.

Cognizant 3.3.2  
Performing  
Personnel

A TDR is initiated using MSFC Form 460 any time a significant problem/anomaly is encountered during testing. An obvious test procedure deviation (TPD) or human factor which is immediately recognized and corrected without disturbing the normal progress of the test is an exception that does not require a TDR.

3.3.2.1

Whenever a significant anomaly occurs during test operations, the test conductor will notify the test engineer/supervisor. The engineer then reviews the test procedure (TCP, etc.) and the available data to determine if a human factor or procedure error is the cause of the anomaly. If the cause is attributed to a procedure error,

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then deviations or mod sheets must be prepared and executed to correct the anomaly. If the cause is a human factor which did not result in any damage or configuration change to the T/A or GSE and a simple recycle of a step or two will correct the anomaly, then no deviation is required.

- 3.3.2.2 The steps that are rerun will be annotated by S&MA as Run 2 in the margin of the TCP page along with the reason for the rerun. If the recycle requires steps not contained in the procedure (i.e., reset a switch that was operated in error), then a procedure change (deviation or redline) is required before testing can be continued. If, after a brief review, the engineer cannot attribute the anomaly to human factor or procedure error and correct the anomaly, then a TDR will be initiated. See Figure 3 for flow diagram.

Cognizant Performing Personnel and S&MA 3.3.3 TDR's will normally be initiated by the person responsible for the hardware. However, S&MA may initiate a TDR when a condition warrants documentation. When an MSFC test facility is being utilized to perform development, acceptance, or qualification testing on MSFC in-house or customer-supplied product without mandatory test coverage by S&MA and the hardware is damaged or potentially damaged as a result of a test facility malfunction or MSFC test personnel error, S&MA shall be contacted to initiate a Test Discrepancy Record (or review the generated TDR) to ensure the facility problem or MSFC operator error is corrected prior to additional testing at the facility.

Cognizant Performing Personnel 3.3.4 Initial disposition of the TDR will be dispositioned by the cognizant engineering personnel in the testing organization where the TDR was originated or by the systems engineer/test conductor.

Cognizant Performing Personnel 3.3.5 TDR's will be entered into MSFC Form 492, Test DR Log (paragraph 3.3.13) to provide traceability. TDR log entries will be closed when each TDR is closed, and completed logs

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and TDR's will be placed in S&MA QRC along with the record copy of the test procedure.

Cognizant  
Performing  
Personnel

3.3.6 Guidelines for processing the TDR's are as follows:

3.3.6.1 Initiation - The initiator will complete an unnumbered MSFC Form 460 through the preprinted checkoff section in block 29 and enter the TDR number on the TDR log.

3.3.6.2 Initial Disposition - Test engineering personnel will make one of the following initial dispositions:

a. Troubleshoot per continuation sheet.

b. Transfer to (organization) for T/S.

c. No T/S required with engineering rationale, description of remedial action taken, statement of retest, and TDR closure and categorization statement.

d. After notifying the responsible engineer, an ECR will be generated and submitted to the CCB to correct erroneous baselined test requirements.

Cognizant  
Performing  
Personnel

3.3.7 TDR Troubleshooting Operations

3.3.7.1 When T/A and/or GSE T/S are required, the T/S steps will be entered on DR Continuation Sheets (MSFC Form 460-1) per Appendix C and T/S may then be initiated.

3.3.7.2 For all tests with mandatory monitoring by S&MA personnel, no T/S may be conducted without S&MA coverage or concurrence.

3.3.7.3 The test engineer will document each step or group of steps before they can be run when the troubleshooting steps are obvious. When monitoring this type of T/S operation, S&MA will ensure that the engineer has adequately documented each step, or series of steps. Troubleshooting may be performed and documented concurrently when the S&MA monitor



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is in agreement.

- 3.3.7.4 If test engineering wants to delete certain steps that have been written, but not executed, then an additional step will be added directing the deletion of these steps. The unwanted steps will not be obliterated. S&MA will write the word "deleted" in the "worked by" column adjacent to the specified steps. S&MA will then close the step per the deletion.
- 3.3.7.5 As each T/S page of the TDR is completed and the steps initialed by the performing individual(s), S&MA will accept the worksteps and the page based on review of recorded results or witness of completed activities for mandatory monitoring.
- 3.3.7.6 If, during TDR T/S operations, other anomalies are discovered not attributable to the same cause as the initial TDR anomaly, new TDR's will be initiated against the same test documentation (TCP, TPS, DR, etc.) that the initial TDR was written against.
- 3.3.7.7 If excerpts from other documents, i.e., TCP's, SOP's, TPS's, etc., are to be used as a part of the T/S operations, a T/S step must authorize and define the excerpt: Example, "Perform Attachment A, 6 pages." If the attachment contains portions, which have been changed in any way from the original copy, then a reproduction of the changed copy will be used for record purposes. All attachment pages containing methodization will be acceptance-stamped by S&MA in the lower right hand corner.
- 3.3.7.8 A utility sequence may be authorized by a T/S step without requiring an attachment: Example, "Perform Sequence 3 of KT-1109."
- 3.3.7.9 When the problem has been isolated, the engineer will summarize his conclusion in a T/S summary defining the problem and sign and date the summary. The T/S summary does not require S&MA approval.

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- 3.3.7.10 If the anomaly is caused by test article hardware/software configuration nonconformance, a DR will be prepared per this procedure. If the anomaly is caused by a facility nonconformance, which adversely affects the test article, a DR will be prepared. When approval of a critical/major nonconforming characteristic to a baselined test requirement is deemed necessary, a DAR will be generated.

Cognizant Performing Personnel 3.3.8 TDR Retest Requirements

- 3.3.8.1 When all T/S and/or disposition operations are complete, the test engineer will address retest requirements including repetition of any invalidated environmental testing. If a breakout box was installed, flight cables disconnected, or fluid connections broken, then the affected systems will be retested. In the case of an electrical connector disconnected, each copper path in the "broken" circuit will be reverified. If retesting is performed after parts replacement or rework, retest requirements and instructions will be provided. If retest is to be accomplished at a later date, a disposition statement specifying the retest will be included, such as, "Retest will be accomplished by KT-7002, Sequences 2, 3, and 4."
- 3.3.8.2 If no problem is found during T/S, the retest disposition statement should so state (i.e., "Retest satisfactorily accomplished in Step X through XX.").
- 3.3.8.3 No TDR will be closed until the retest has been satisfactorily completed and a disposition added to the TDR stating that the retest was satisfactory.
- 3.3.8.4 All functional TDR anomalies require satisfactory retest for TDR closure.
- 3.3.8.5 If no retest is required, then a disposition will be included in the TDR giving the

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rationale for "no retest."

Cognizant Performing Personnel	3.3.9	<u>TDR Form Instructions</u>  MSFC Form 460 will be initiated as a TDR in accordance with paragraph 3.3 and prepared in accordance with <u>Appendix D</u> .
Cognizant Performing Personnel	3.3.10	Dispositions for block 29 entries will be in accordance with <u>Appendix D</u> .
Cognizant Performing Personnel	3.3.11	Closure instructions will be in accordance with <u>Appendix E</u> .
Cognizant Performing Personnel	3.3.12	<u>TDR Filing</u>  The closed TDR (Record Copy) and continuation sheets will be filed with their logs and the record copy of the TCP, TPS, DR, etc. in the project designated record center.
Cognizant Performing Personnel	3.3.13	<u>TDR Log Form Instructions</u>  MSFC Form 492, TDR Log, will be used to log all TDR's initiated against each separate test document being conducted (i.e., TCP's, TPS's, Retest DR's, etc.). The form will be completed in accordance with <u>Appendix F</u> .

#### 4. RECORDS

The following records shall be maintained per MPG 1440.2, "MSFC Records Management Program." TDR's and TDR logs (enclosed with the as-run test procedure) will be maintained on file by S&MA (other project designated record centers shall have a plan to maintain records per MPG 1440.2) as long as the hardware remains in flight inventory. Once the QRC is notified that the hardware is retired from flight inventory, the TDR's and TDR logs will be moved to historical files. Blocks of closed DR's will be moved to historical files in numerical sequence when the majority of the closeout dates are older than 5 years.

4.1 MSFC Form 460, "Discrepancy Record"

4.2 MSFC Form 460-1, "Discrepancy Record Continuation Sheet"

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4.3 MSFC Form 492, "Test Discrepancy Record Log"

4.4 Scrap Custody Records

## 5. FLOW DIAGRAM

See Figures 1 through 3.

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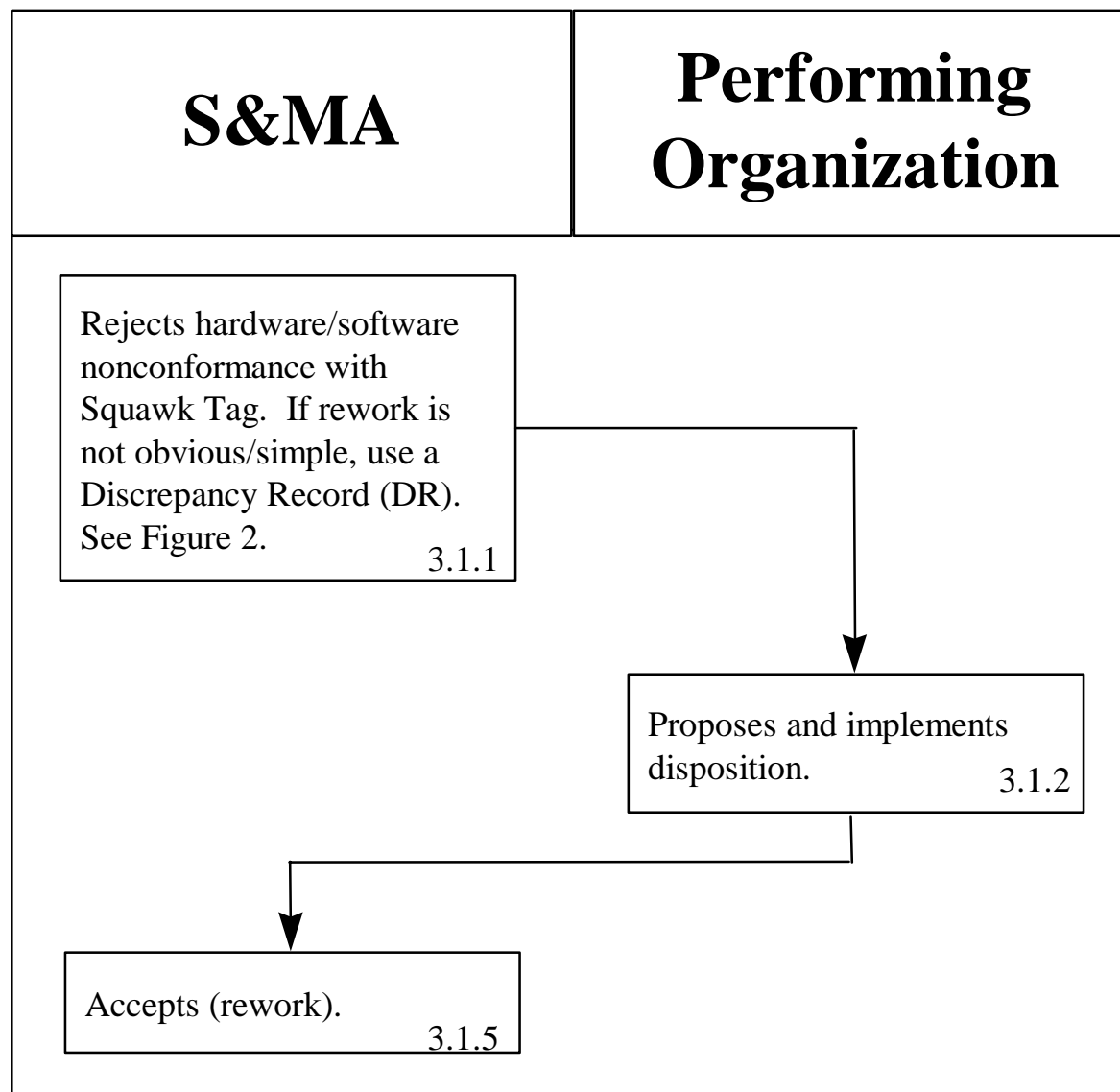


Figure 1. Nonconformance Routing (Squawk Tag)



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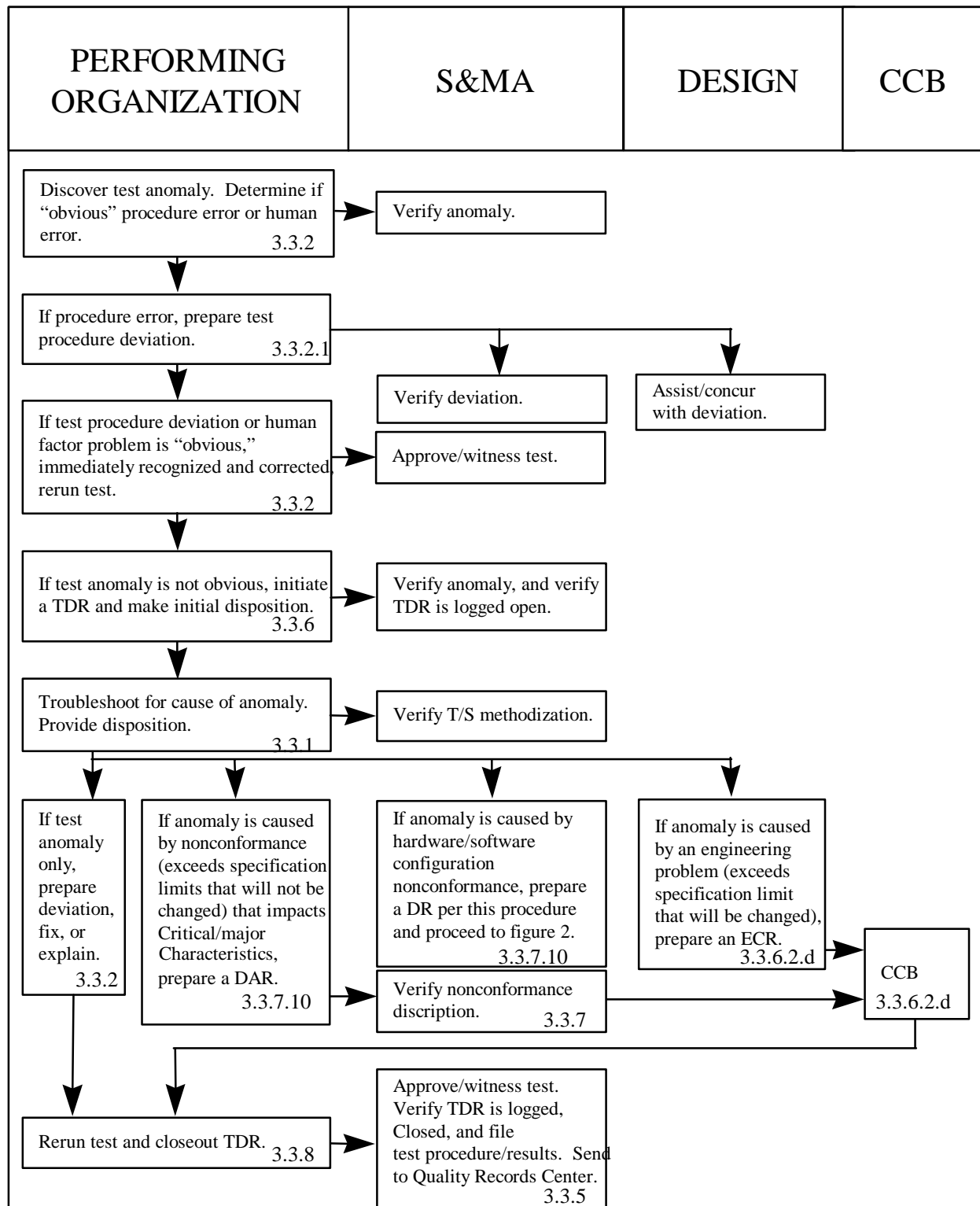


Figure 3. Nonconformance Routing (TDR)

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## APPENDIX A

### SQUAWK TAG (SEE FIGURE 4)

	Block	Entry Description
Cognizant S&MA	1	Preprinted Squawk Tag Number.
Cognizant S&MA	2	Enter Part Number (P/N).
Cognizant S&MA	3	Enter Serial Number (S/N) or "NA."
Cognizant S&MA	4	Enter Date.
Cognizant S&MA	5	Enter initiator's (inspector's) name.
Cognizant S&MA	6	Enter part name (abbreviate).
Cognizant S&MA	7	Enter reference designator of electrical part, if applicable or "NA."
Cognizant S&MA	8	Initiator enters a clear, concise description of the nonconformance. For reference information, enter the unique number of the WAD. Attach initiated tag to the nonconforming item or WAD.
Cognizant Performing Personnel	9	Performing personnel enter a clear, concise description of the rework to be performed. If the nonconformance turns out to be of such significance as to require initiation of a DR, the initiator references the DR number and closes the Squawk Tag. Completed Squawk Tags, or worked portions thereof, will not be voided.
Cognizant Performing Personnel	10	Signature of the dispositioner.



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Cognizant Performing Personnel	11	Signature, initials, or stamp of the individual performing rework.
Cognizant S&MA	12	S&MA closes the Squawk Tag and acceptance stamps block 12 upon completion of satisfactory rework.
Cognizant S&MA	13	S&MA dates block 13, files the hard copy with the record copy of the work-authorizing document, The completed white copy may be retained by the closeout inspector as a historical record or discarded.

MSFC - Tag 6 (November 1974)

1-3876-3

Figure 4. Sample Squawk Tag (MSFC Tag 6)

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## APPENDIX B

### DISCREPANCY RECORD (SEE FIGURE 5)

	Block No.	Entry Description
Cognizant S&MA	1	Enter TDR number if DR resulted from a TDR. Enter QTPS number if DR results from a QTPS or enter NA.
Cognizant S&MA	2	Enter page numbers; leave "of ____" blank until closure, and then enter total number of pages.
Cognizant S&MA	3	Enter part name of nonconforming item.
Cognizant S&MA	4	Enter P/N of drawing and drawing revision.
Cognizant S&MA	5	Enter S/N of item, or if none, use lot number or enter not applicable, "NA."
Cognizant S&MA	6	Enter Engineering Parts List number and revision or enter "NA".
Cognizant S&MA	7	Number prestamped (for DR only).
Cognizant S&MA	8	Leave Blank.
Cognizant S&MA	9	Leave Blank.
Cognizant S&MA	10	Enter the manufacturer or supplier of part.
Cognizant S&MA	11	Enter part effectivity number; example: (LI02, SX02, AR04, etc.).
Cognizant S&MA	12	Enter parts tag number (previously Inspection Report [IR] Tag) if applicable.
Cognizant	13	Enter name of next higher assembly, if

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S&MA known; otherwise, leave blank or final for top assy.

Cognizant 14 Enter P/N of next higher assembly if  
S&MA known, otherwise leave blank or final for top assy.

Cognizant 15 Enter three-letter code identifying  
S&MA the operation in progress when nonconformance was detected.

<u>Operation</u>	<u>Code</u>
Development Test	DEV
Qualification Test	QAL
Manufacturing and Assembly	MFG
Acceptance Test	ACC
Receiving	REC
In-flight Anomaly	IFA
Post Flight Anomaly	PFA
Calibration	CAL
Other (Define)	XXX

Cognizant 16 Reference the document and its number  
S&MA (if applicable) to which the inspection/test is being performed, such as TCP-5600, DR-2042, TDR-001-3, W.O., etc. If unknown, leave blank.

Cognizant 17 Enter program affected.  
S&MA

Cognizant 18&19 Leave blank.  
S&MA

Cognizant 20 Check applicable block for  
S&MA nonconforming item's hardware category.

Cognizant 21 Starting with 1, enter consecutive  
S&MA numbers for each nonconformance being entered.

Cognizant 22 Leave step and time spaces blank.  
S&MA Enter clear, concise description of the nonconformance or for each nonconformance for multiple nonconformances. Use MSFC Form 460-1 or additional numbered pages 1A, 1B,

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etc., as required. At end of description, enter "Requested by (name of individual requesting DR)," if appropriate.

- |                                |    |                                                                                                                                 |
|--------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------|
| Cognizant S&MA                 | 23 | Initiator print or sign legible name.                                                                                           |
| Cognizant S&MA                 | 24 | Enter initiator's organization symbol.                                                                                          |
| Cognizant S&MA                 | 25 | Enter name of test conductor or supervisor of personnel performing the last operation, or name of responsible project designer. |
| Cognizant S&MA                 | 26 | Enter QC acceptance stamp on the record copy and also stamp each subsequent copy individually.                                  |
| Cognizant S&MA                 | 27 | Enter date of inspection. Initiator distribute form copies per paragraph 4.2(h).                                                |
| Cognizant Performing Personnel | 28 | Dispositioner enters next sequential number of disposition being entered in block 29 starting with number 1.                    |
| Cognizant Performing Personnel | 29 | Dispositioner enters remedial action dispositions sequentially. See dispositions for block 29 below.                            |

a. Leave pre-printed dispositions blank.

b. For "Explainable Condition," DR's engineering rationale for why no nonconformance exists must be included in the closure disposition.

c. On dispositions of "Scrap" where the value of item(s) being scrapped exceeds \$5000.00, enter the Lead System Engineer's signature.

d. Items dispositioned as RTV will be returned to the vendor through the contracting officer in accordance with

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the contract.

e. All approved dispositions on DR's will contain complete instructions or a reference to the instructional document used. All referenced documents used will have the S&MA acceptance copies attached to the DR upon completion. When applicable, drawings and specs will be referenced. All repair work will be acceptance stamped on the DR. Any additional inspection requirements will be identified on this DR.

f. All unique safety requirements not specified in existing procedures will be identified.

g. When parts are to be removed for repair or replacement with a like item, the disposition will reference or specify repair and handling requirements. If the removal is temporary, the DR will also provide directions for reinstallation.

h. When a nonconformance involves a functional failure or part, component or assembly, the DR disposition will require a failure analysis, and the results will be included with the DR. The failed part may be split to a separate DR for failure analysis tracking.

i. Requirements for retest will be specified when a functional component or part has been invalidated [i.e., replacement of part(s) disconnecting wires, etc.]. The DR will remain open until the retest has been satisfactorily completed and a summary statement added to the DR.

(1) The retest procedures will be specified on the DR (or TDR if one has been prepared) or reference made to an

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issued test procedure which will accomplish the retest.

(2) If no retest is required, the closing disposition will state this fact.

j. During the test operation, the determination of whether any DR is constraining or not constraining to the start and/or continuation of test activities is the responsibility of the test conductor/engineer. Therefore, remedial action may be delayed to a later time for those DR's for which the test conductor/engineer has entered the disposition: "This DR is not a constraint to testing."

Cognizant Performing Personnel	30	Enter performing individual's signature, initials, or stamp for the step being performed.
Cognizant S&MA	31	Enter inspector's Acceptance Stamp and date for each work step.
Cognizant Performing Personnel	32	Dispositioner checks applicable block, if MRB is required, enters appropriate item number, and notifies MRB chairman of request for MRB action.
Cognizant S&MA	33-34	Acceptance and closures of DR's will be made only after (1) all rework is accomplished, (2) any required retests are performed, (3) all associated documentation is attached (i.e., photos, WAI's, etc.), (4) other appropriate dispositions have been completed, and (5) their acceptance by S&MA accomplished. DR closure will consist of S&MA acceptance stamping and dating of the final acceptance block, and in block 33, circling the appropriate summary block of the remedial action performed. Block 33 final disposition summaries are listed at the end of Appendix B.

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Cognizant                      35     Leave blank.  
S&MA

Cognizant                      36     S&MA acceptance stamp.  
S&MA

### **BLOCK 33 FINAL DR DISPOSITION SUMMARIES**

- 1     "RPR" - Repair
- 2     "UAI" - Use-As-Is
- 3     "GT" - Ground Test Use Only
- 4     "Rwk" - Rework to drawing/spec.
- 5     "WAI" - Request for waiver of requirements
- 6     "RTV" - Return to Vendor
- 7     "Scp" - Scrap
- 8     "C/SC" - Configuration/Specification Change
- 9     "Other" - (Use this for two or more of the above and for Explainable/Unexplainable Conditions)





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### APPENDIX C

#### DISCREPANCY RECORDS CONTINUATION (Form 460-1)

	Block No.	Entry Description
Cognizant S&MA	1	Leave blank.
Cognizant S&MA	2	Leave blank for DR. Enter TDR number if used with TDR.
Cognizant S&MA	3	Enter page number leaving "of ____" blank until closure, then enter total pages.
Cognizant S&MA	4-5	Leave blank.
Cognizant S&MA	6	If used with DR, enter DR number from page 1. If used with TDR, leave blank.
Cognizant S&MA	7	Enter next sequential number of entry being made. Use large center space for all T/S, summaries, work operations, etc. TDR closure dispositions will only go on pages numbered 1, 1A, 1B, etc., as appropriate.
Cognizant S&MA	8	Enter performing individual's initials, signature, or stamp.
Cognizant S&MA	9	Enter S&MA acceptance stamp/date of all work steps.
Cognizant S&MA	10&12	Enter S&MA acceptance stamp/date of all work steps.
Cognizant S&MA	11	Leave blank.

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## APPENDIX D

### TEST DISCREPANCY RECORD

Block Entry Description  
No.

Cognizant Performing Personnel or S&MA	1	Enter next sequential number from TDR Log maintained with the record copy of the TCP, TPS, etc.
Cognizant Performing Personnel or S&MA	2	Enter page number and circle sheet number as pages are added. Enter page X of XX only at closeout so that total number of pages will be correct.
Cognizant Performing Personnel or S&MA	3-8	Leave blank.
Cognizant Performing Personnel or S&MA	9	Leave blank.
Cognizant Performing Personnel or S&MA	10	Leave blank.
Cognizant Performing Personnel or S&MA	11	Enter effectivity of item under test; (i.e., SX02, LI02, AR04.)
Cognizant Performing Personnel or S&MA	12-14	Leave blank.
Cognizant Performing Personnel or S&MA	15	Enter three-letter code identifying the operation in progress when nonconformance was detected.

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<u>Operation</u>	<u>Code</u>
Development Test	DEV
Qualification Test	QAL
Manufacturing and Assembly	MFG
Acceptance Test	ACC
Receiving	REC
In-flight Anomaly	IFA
Post-flight Anomaly	PFA
Calibration	CAL
Other (define)	XXX

Cognizant Performing Personnel or S&MA	16	Enter number of test documentation (TCP, TPS, DR, etc.) being conducted.
Cognizant Performing Personnel or S&MA	17	Enter subsystem.
Cognizant Performing Personnel or S&MA	18-20	Leave blank.
Cognizant Performing Personnel or S&MA	21	Enter next consecutive number of anomaly being entered when more than one similar anomaly is being recorded.
Cognizant Performing Personnel or S&MA	22	Enter test procedure step and clock time of anomaly occurrence. Enter clear, concise description for each anomaly.
Cognizant Performing Personnel or S&MA	23	Name of initiator.
Cognizant Performing Personnel or S&MA	24	Organization of initiator.
Cognizant	25	Signature of test conductor or

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Performing  
Personnel  
or S&MA                      supervisor of personnel performing the last operation if different than initiator. Leave blank if the same.

Cognizant                      26      Leave blank unless initiated by S&MA  
Performing  
Personnel  
or S&MA                      personnel.

Cognizant                      27      Date of initiation.  
Performing  
Personnel  
or S&MA

Cognizant                      28      Enter next consecutive number of each  
Performing                      and every separate step of  
Personnel                      disposition, instruction, T/S step,  
                                         summary, etc., starting with Step 1.

Cognizant                      29      Disposition: When a TDR is generated,  
Performing                      test engineering is to enter  
Personnel                      dispositions in accordance with  
                                         paragraphs 3.3.6.2 through 3.3.8.

a. If the problem constrains test operations, check "Yes" and enter the event or number of the test, which is constrained by the condition documented.

If the problem does not constrain test operations, check "No."

b. Check appropriate block to indicate whether or not the disposition included hazardous operations. Sign and date in space provided.

c. T/S Plan Req. - Leave blank.

d. Enter initial disposition per paragraph 3.3.6.2.

e. When the source of the problem/anomaly has been identified, enter a summary of T/S clearly identifying the source of the anomaly.

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f. Enter any required remedial action dispositions.

g. Enter any required retest dispositions and statements.

h. Number the steps consecutively and key the steps to the corresponding item of the nonconformance entry.

i. Enter appropriate TDR "closure" disposition per Appendix E. TDR closure dispositions must be entered on page 1, 1A, 1B, etc., as appropriate.

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## APPENDIX E

### TEST DISCREPANCY RECORD CLOSURE INSTRUCTIONS

- |                                |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cognizant Performing Personnel | E.1.1   | The closure instructions for "Procedure Error" are as follows:                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                | E.1.1.1 | If T/S indicates the problem to be caused by procedure error, the closure disposition of the TDR must reference the permanent deviation/mod sheet, MSFC Form 3959, Test Procedure Deviation (TPD), or requirements change which corrects the procedure error: Example, "TPD 23 written to correct procedure. Close this TDR as a Procedure Error."                                                                                                                        |
|                                | E.1.1.2 | When closing a TDR in this way, the test engineer should be sure that the deviation correcting the procedure was run, either in the procedure or as portions of the T/S activities. This retest is required to prove that there was in fact a procedure error. Unless this is done, the deviation will not be accepted by S&MA for incorporation into the procedure.                                                                                                      |
| Cognizant Performing Personnel | E.2.1   | The closure instructions for "Human Factor" are as follows:                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | E.2.1.1 | If a human factor is determined to be the cause of the anomaly, then the closure disposition must state that no T/A or GSE damage occurred as a result of the anomaly. (If an anomaly caused by human factor requires rework, modification, or repair, then a DR must be initiated against the hardware affected.) The final statement should be "Close this TDR as Human Factor." Additional signature of department manager, supervisor, or test conductor is required. |
| Cognizant Performing Personnel | E.3.1   | The closure instructions for "Explainable Condition" are as follows:                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                | E.3.1.1 | If the nonconformance documented on the TDR after investigation or T/S proves to be a                                                                                                                                                                                                                                                                                                                                                                                     |

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normal condition not requiring remedial action, then the TDR may be closed as an explainable condition. The T/S summary or engineering conclusion should provide a clear, concise explanation of the condition and state that there is no affect on system performance. The final disposition should be "Close this TDR as an Explainable Condition." Additional signature of department manager, supervisor, or test conductor is required.

- |                                      |         |                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cognizant<br>Performing<br>Personnel | E.4.1   | The closure instructions for "Facility" are as follows:                                                                                                                                                                                                                                                                                               |
|                                      | E.4.1.1 | If the T/S indicates the problem is "nonsupport" from a facility, the test engineer will report the trouble to the appropriate facility support organization and obtain remedial action. Once remedial action has been accomplished and a satisfactory retest accomplished, the closure disposition should be "close this TDR as a facility problem." |
| Cognizant<br>Performing<br>Personnel | E.5.1   | The closure instructions for "T/A or GSE Hardware" are as follows:                                                                                                                                                                                                                                                                                    |
|                                      | E.5.1.1 | If T/S determines the cause of an anomaly to be in a T/A or GSE (assembly, subassembly, component, cable, etc., or test requirement), S&MA is to be notified to initiate a DR against the nonconforming item. All removal, replacement, reinstallation, and system retest instructions will be a part of the TDR dispositions.                        |
|                                      | E.5.1.2 | However, all actions performed on the item as a separate entity will be defined and executed on the DR. The TDR must reference the DR number initiated and the S/N of the nonconforming item.                                                                                                                                                         |
|                                      | a.      | If the item is removed for remedial action and later reinstalled, then the TDR must remain open until reinstallation and a satisfactory retest is accomplished.                                                                                                                                                                                       |
|                                      | b.      | If the item is removed and is to be replaced                                                                                                                                                                                                                                                                                                          |

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by a spare item, then the TDR must reference the DR number and S/N of the nonconforming item and also the S/N of the replacement item. Once replacement has been accomplished, the TDR may be closed upon satisfactory completion of a retest.

- c. Other work operations are permitted to provide remedial actions on TDR's limited to the following cases:

- (1) Modification of GSE.

- (2) Incorporate adjustments/work order, TPS, or other test.

- (3) Adjustments/calibrations on test GSE.

- E.5.1.3 In these cases, the TDR will remain open until the work operations have been completed, a satisfactory retest has been accomplished, and the closure disposition references all associated documentation (such as a work order, TPS, or engineering order), which was implemented to correct the condition.

Cognizant  
Performing  
Personnel

- E 6.1 The closure instructions for "Unexplained Condition" are as follows:

- E 6.1.1 When all T/S possibilities have been exhausted with no definite conclusion as to the cause of the anomaly, the TDR can be closed as an "Unexplainable Condition" by all of the following:

- a. A statement by the test engineer that cause cannot be established and a statement describing the most likely cause.
- b. Inclusion by the design organization's designee of the risk assessment with TDR closure, and the potential failure modes and any possible affect on missions.
- c. A closure disposition of "Close this TDR as an Unexplainable Condition" approved by the appropriate Lead Systems Engineer.



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Cognizant Performing Personnel      E.7.1      The closure instructions for "Computer" are as follows:

                                         E.7.1.1      If T/S indicates the anomaly to be due to hardware/software problems with a ground computer, then the TDR can be categorized as a "Computer Problem." The closure disposition should reference the documentation that corrected the problem with the computer and state "Close this TDR as a Computer Problem."

Cognizant Performing Personnel      E.8.1      The instructions for "Acceptance" are as follows:

                                         Block Entry Description  
                                         No.

                                         30      Performing individual initials or stamps all work steps performed.

                                         31      Performing individual initials or stamps all work steps performed.

                                         32,33      Leave blank.  
                                         &35

                                         34&36      Final Acceptance - Prior to final acceptance stamp/date block 36 of each TDR, S&MA will ensure that each item in the following checklist has been accomplished:

                                         a.      Block 1 has been annotated with numbers of all additional pages.

                                         b.      All dispositions have been completed and accepted by S&MA.

                                         c.      Each work step has been accepted by S&MA.

                                         d.      Each "continuation" sheet has been accepted by S&MA.

                                         e.      A T/S summary was written and signed/dated by the engineer.

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f. All the necessary approval signatures are present:

(1) Cognizant performing personnel designated to make engineering dispositions or the appropriate Lead Systems Engineer.

(2) On TDR's containing hazardous operations which increase the hazard level of the test operations being conducted (i.e., TCP, TPD, DR, etc.), Safety approval has been obtained.

(3) On TDR summaries concluding the problem to be an "Explainable Condition" or on TDR's to have been due to a "Human Factor," approval of dispositioning engineer's department manager or the test conductor/supervisor has been obtained.

g. All necessary supporting documents and/or data sheets are attached.

h. A retest statement has been made.

i. A closure disposition has been made on page 1, 1A, 1B, etc.

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## APPENDIX F

### TEST DISCREPANCY LOG

	Block No.	Entry Description
Cognizant Performing Personnel	DOCUMENT	Enter unique number of document being conducted (i.e., TCP-KT001, TPS-A1042, etc.).
Cognizant Performing Personnel	RUN NO.	Enter run number of TCP if applicable.
Cognizant Performing Personnel	T/A	Enter name/designation of article under test.
Cognizant Performing Personnel	S/N	Enter serial number of T/A.
Cognizant Performing Personnel	PAGE_OF_	Enter pages of log as appropriate.
Cognizant Performing Personnel	TDR NO.	Enter sequential number for each TDR initiated starting with number 1. The full TDR number is the document number followed by a dash and the number from this block. Examples of TDR numbers:  (a) DR's - 8042-3 (third TDR against this DR).  (b) TCP's - KT-0001-10 (tenth TDR against TCP KT-0001).  (c) TPS's - A1320-2 (second TDR against this TPS).
Cognizant Performing Personnel	PROBLEM	Enter brief description of (Description) problem/anomaly.

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Cognizant  
Performing  
Personnel

DR NO.      Enter DR number for all DRs  
resulting from each TDR.

Cognizant  
S&MA

ENTERED      Enter stamp/date of log entry.  
BY

Cognizant  
S&MA

CLASSIF-      Enter stamp of individual closing  
ICATION      TDR in the appropriate  
problem/anomaly category block.

Cognizant  
S&MA

CLOSED      Enter stamp of individual closing  
TDR and date of closure.

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# WITHHOLD

PART NAME:	CONTRACTOR'S PART NO.:	TAG NO.:
SUPPLIER'S PART NO.:	PART SERIAL NO.:	PROJECT:
<b>REASON FOR WITHHOLDING</b>		
<p align="center"><b>MRB REQUIRED</b></p> <p align="center">DO NOT OPEN, MODIFY, DISTURB, OR MISHANDLE THIS ITEM IN ANY MANNER THAT COULD DISTURB ITS NONCONFORMING STATE (Ref. S&amp;E 5330.7).</p>		
<b>LOCATION</b>		
DISPOSITIONING FORM (Title & Serial No.):		
INSPECTOR'S SIGNATURE:	DATE:	STAMP:

MSFC - Tag 10 (October 1981)

★ U. S. GOVERNMENT PRINTING OFFICE: 1981-546-516

Figure 6. Withhold Tag (MSFC-Tag 10)

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## APPENDIX G

### SCRAP INSTRUCTIONS

These instructions do not apply to obvious scrap articles or materials such as cutting and boring chips, tag ends, cured adhesive materials or samples, etc., which could not be, under any circumstances, used in manufacturing operations.

Use of scrap items for non-production purposes (shop aids, engineering evaluation, etc.) is allowable, provided that adequate controls are established to prevent scrap usage in manufacturing operations. When these scrap items are not used on a continuing basis, the storage control requirements of section G.1.2 herein apply. Scrap items used for display shall be permanently identified as specified in section G.1.1 herein.

- |                                                     |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cognizant<br>Performing<br>Personnel<br>and/or S&MA | G.1.1 | <p>All scrap hardware and raw material shall be permanently identified in such a manner as to prevent confusion with acceptable hardware and materials. The following methods are acceptable for identification of scrap hardware and raw materials. Identification must be accomplished immediately after the hardware or material is determined to be scrap, unless immediate, complete destruction of the scrap hardware or material is planned.</p> <p style="margin-left: 40px;">G.1.1.1 <u>Impression Stamping</u>. A unique stamp signifying scrap hardware or raw material may be used for identification purposes when such stamp will produce a highly visible, distinct impression in the material. Stamped identification shall be placed in conspicuous locations and shall be as large as practical. Ink stamping shall not be used for identification of scrap hardware or material.</p> <p style="margin-left: 40px;">G.1.1.2 <u>Etching</u>. Scrap hardware and raw materials may also be identified by etching the word "SCRAP" on the hardware or material. Any permanent method of etching may be used. "SCRAP" markings shall be placed in conspicuous locations and shall be as large as practical.</p> |
|-----------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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G.1.1.3 Painting. Impression stamping and etching are the preferred methods of identifying metallic scrap hardware and raw materials as scrap; painting the item with red paint is acceptable. This method is particularly suited for use on large items, nonmetallic materials, and materials which must be identified on the exterior packaging (liquids, powders, hazardous materials, etc.)

Cognizant Performing Personnel and S&MA      G.1.2      All scrap hardware and raw material shall be physically segregated from acceptable material, as well as from other nonconforming material awaiting disposition. Scrap items (which are not immediately disposed) shall be stored in an enclosed, locked area. All transfers into and out of the storage area shall be logged. Scrap items, which are too large to be placed in a storage area, will be barricaded, and signs identifying the area as "restricted access scrap area" will be permanently displayed. Access to all areas used as scrap storage will be limited to personnel authorized by the responsible Quality Assurance Lead and/or Management.

Cognizant Performing Personnel and/or S&MA      G.1.3      Disposal of scrap hardware and raw material shall be accomplished as soon as possible after the decision to scrap the item has been made. Installation of scrap items into the next higher assembly and the use of scrap raw material for manufacturing operations shall be made impossible by disposal. Any method of disposal (cutting, hammering, drilling, burning, etc.), which ensures that scrap hardware cannot be installed in the next higher assembly and that scrap raw material cannot be used for manufacturing operations, is acceptable.